



ZDR Calibration Update

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Overview

- ▶ ZDR calibration affects base data quality interpretation and algorithm output
 - ▶ ZDR bias within ± 0.2 dB is considered “good” (Within recommended limits)
- ▶ A 23-task recommendation was presented in 2014 from the ZDR Sub-Committee
 - ▶ These were split into 4 main projects
- ▶ Several tasks have been completed
- ▶ Several are in-progress
- ▶ Several are on hold awaiting results of previous tasks





Completed



In Progress



More Work Needed

1 - RDA Test Software

ECP 0715

- A-6 Refine Suncheck Sub-test 1 ✓
- A-7 ZDR Calibration Clarification ✓
- A-9 VCP for Bragg Scatter ✓
- A-10 CW Test Signal Timing ✓
- B-6 Solar Box Scans – for all subtests ○

2 - RPG Hosted Calibration Monitoring

ECP 0716

- A-1 External Target Bias Uncertainty ○
- A-2 External Target Methods to RPG, incl. Data Quality Dashboard ✓
- A-3 Bias Estimate from Ground Clutter - NSSL Report ✓
- B-1 Receive Path Tracking – using sun spikes (migrate to use of B-7) ○
- B-2 Transmit Path Tracking (B-1) ✓
- B-3 Bias Estimate from Ground Clutter (A-3) ◆

3 - Dual Pol Hardware Engineering (RF Pallet and AME)

ECP 0718

- A-4 Update 30 dB Coupler Values ✓
- A-5 Analyze 30 dB Coupler Values ○
- A-8 Receiver Linearity – investigate/mitigate if needed ◆
- B-4 RF Pallet Test Capability – focus on couplers ◆
- C-4 RF Pallet Refresh - analysis and requirements only ◆
- C-5 Automate System Bias Measurements – crossed and straight switch ◆

4 - RDA Hosted External Target ZDR Calibration

- B-5 Cross Polarization Power Calibration ◆
- B-7 Performance Check Box Scans (B-6) ◆
- B-8 RDA Based External Target Monitoring (A-1, A-9, C-1) ◆
- C-1 Bragg Scatter Bias Estimate at RDA (A-9) ◆
- C-2 Correct Transmit and Receive Paths Using External Targets (B-1, B-3, B-8) ◆
- C-3 Antenna Control - requirements input to SLEP only ◆

External Target Updates

- ▶ RPG-based external target methods (rain, snow, and Bragg) went live with 2-decimal place precision in B16
 - ▶ Bragg scatter will be allowed to make estimates in all VCPs starting in B18 (currently only makes estimates in VCP 21 and 32)
- ▶ The Data Quality Dashboard to graphically display these estimate in shade chart style is projected for B18

Outreach

- ▶ A webinar was presented by the ROC to many field sites and partners to discuss the complications and teamwork involved with ZDR calibration
 - ▶ Available via the ROC Hotline page
 - ▶ Partner coordination increased since the Oct. webinar!
- ▶ Latest monthly ZDR shade charts are now available via the ROC Hotline page
 - ▶ ROC partners can use NOAA login to view



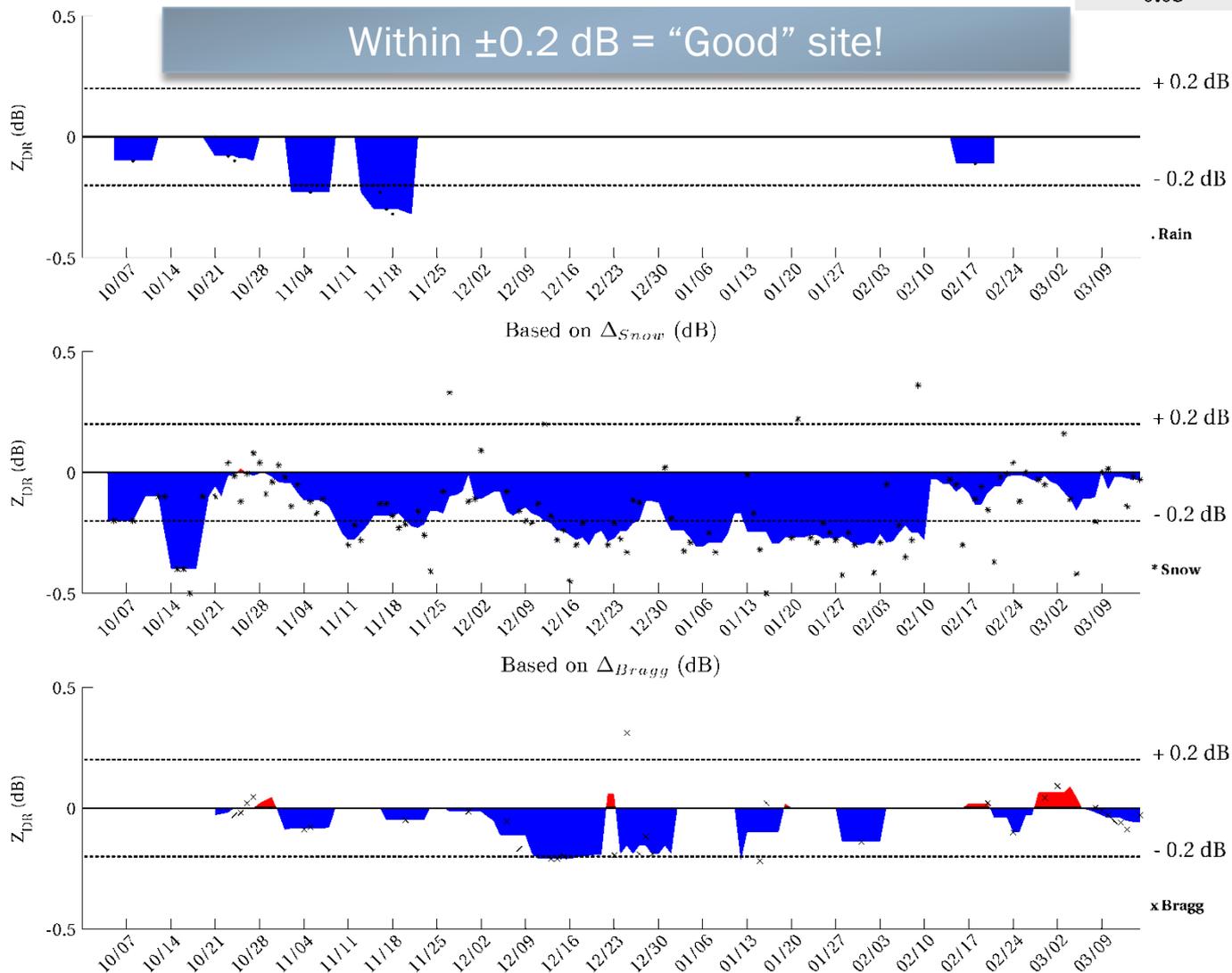
Shade Charts

- ▶ Shade Charts use-running median shading
- ▶ A Weighted-Mean monthly estimate has been included to help assess site bias trends
 - ▶ The weighted mean takes into account method variability and also gives more contribution than a single median number
 - ▶ Current weights (could be changed pending future investigation of variability):
 - ▶ Rain 25%
 - ▶ Snow 33 %
 - ▶ Bragg 42%



Duluth, MN (KDLH) Systematic Z_{DR} Bias (7-day median shading) Oct'15-Mar'16
Based on Δ_{Rain} (dB)

**Mar'16 WMean
(All 3 Methods):
-0.03**



Summary

- ▶ ZDR Calibration is a difficult effort that requires teamwork to analyze and resolve
- ▶ The ROC and partners continue to make strides for improved ZDR calibration
 - ▶ Most of the sites show consistent calibration once set unless another hardware failure arises
- ▶ We continue to investigate new techniques as beneficial solutions
 - ▶ Such as Linearity, Box Scans, Ground Clutter Tracking, etc.



Questions?

